2/2 023 UNCLASSIFIED PROCESSING DATE--13NOV7C
CIRC ACCESSION NO--AT0134797
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SYSTEMS TRI,N,OCTYLAMINE,H SUB2 O,ACID WERE STUDIED BY USING THE ACIDS HCL, H SUB3 PO SUB4, HNO SUB3, AND H SUB2 SO SUB4. POTENTIOMETRIC TITRIN. AND IR METHODS WERE USED TO ANALYZE THE PHASES. IN THIS SYSTEM THERE IS A LARGE REGION IN WHICH 3 LIQ. PHASES COEXIST: AN AQ. AND 2 ORG. PHASES. ONE ORG. PHASE CORRESPONDS TO THE HYDRATED SALT OF TRIOCTYLAMINE AND THE CORRESPONDING ACID AND THE OTHER PHASE TO THE PURE AMINE. THE IR DATA ESTABLISHED THE INTER PRESENCE OF INTERACTION BETWEEN THE SALT AND WATER USING THE HCL SALT AS EXAMPLE. FACILITY: INST. NEORG. KHIM., NOVOSIBIRSK, USSR.

UNCLASSIFIED

Acc. Nr: AP0049777 Abstracting Service: CHEMICAL ABST. 5-70 Ref. Code: UR0191

G

101972k Determination of acyl groups in cellulose acetatebutyrates. Mironov, D. P.; Grishin, E. P.; Zharkov, V. V.; Pogosov, Yu. L. (USSR). *Plast. Massy* 1970, (1), 64–5 (Russ). The total content of acyl groups in cellulose acetatebutyrate (I) was detd. by sapon., whereas the content of PrCO groups was detd. by ir spectroscopy at 2970 cm^{-1}. Thus, I was placed in a conical flask and mixed with Me_2CO and set aside for 30–60 min. The mixt. was shaken, and 0.5*N* aq. MeOH soln. of NaOH was added; the mixt. was refluxed at 65° for 3 hr. The sapond. sample was neutralized with 0.5*N* HCl and titrated with 0.5*N* KOH. Optical d. of I was measured at 2970 cm^{-1} and of a std. at 1430 cm^{-1}. The content of PrCO groups was detd. from the ratio D2970/D1470 and from the corresponding adsorption coeffs. The content of Ac groups was calcd. from a general equation. CKJR

REEL/FRAME
19801695

USSR UDC 621.396.6.72:621.791

KOPYLOV, Yu. N., GRISHIN, I. S., SADOVSKIY, A. A.

"On the Problem of the Stressed State of Joints in Diffusion Welding"

V sb. Progressivn. tekhnol. i novoye oborud. dlya proiz-va elektron. priborov (Progressive Technology and New Equipment for Making Electronic Devices--collection of works), Saratov, 1970, pp 85-87 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12V310)

Translation: The authors discuss the possibility of reducing residual stresses caused by the difference in physicomechanical characteristics of materials in welded joints of dielectrics with metals. The results of a study of welded joints in quartz glass show that minimum residual stresses are observed when high-ductility metals are used (Ag and Cu) in thin layers; etching of the ground-glass surface immediately before welding also promotes reduction of the stress level. N. S.

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USSR

UDC 621.73.042:014.5-135.4

GRISHIN, L. G. and SOKRISHIN, Yu.P.

"Temperature-Rate Dependence of Resistance of Certain Metals to Deformation"

Moscow, Kuznechno-shtampovochnoye proizvodstvo, No 4, Apr 72, pp 8-9

Abstract: Cited are the results of experiments on the resistance of 45 steel, and AK6 aluminum and VT3-1 titanium alloys to plastic deformation as a function of deformation temperatures and rates. The data are based on tests involving unsetting the metals' specimens (20 mm in diameter and 30 mm long) with the use of a gunpowder pile driver. The test results are reflected in curves showing the variations of specific pressures at various temperatures and deformation ratios, at speeds ranging from 500 to 7000 sec^{-1}. The maximal points on the curves reflecting the resistance to deformation vs. deformation rates for the 45 steel and AK6 alloy are attributed to the thermal effect of plastic deformation which is qualitatively different with increasing rates than under static deformation rates. (4 illustrations, 1 table, 11 bibliographic references)

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UDC: 681.327

USSR

BURDONSKIY, I. N., GRISHIN, M. P., KURBANOV, Sh. M., MARKELOV, V. P., SERGEYEV, V. V., SIDORENKO, V. R., TSEREVITINOV, S. S., SHABUROVA, L. M., Moscow

"Computer Processing of Optical Interference Patterns"

Novosibirsk, Avtometriya, No 4, Jul/Aug 71, pp 21-26

Abstract: The paper is a report of initial experiments in using a photometric scanning system in conjunction with a general-purpose computer for analyzing halftone images (optical interference patterns). Line-scanning of the pattern was used for computer input through an analog-digital converter with 64 levels of quantization. A flowchart of the processing program is given. The results of computer processing on the Minsk-22 computer are compared with manual analysis for plasma interference patterns. Excellent agreement is observed with a time reduction of more than two orders of magnitude for machine processing. The authors thank V. S. Vaynshteyn and M. I. Pergament for taking part in the initial phase of the work. Three figures, bibliography of five titles.

1/1

USSR

UDC 621.383.292.8

LEVIN, G.E., GRISHIN, M.YE., PCTAPCV, A.M.

"Photoelectron Device"

USSR Author's Certificate No 253951, filed 5 June 68, published 16 June 70 (from RZh--Elektronika i yeye primeneniye, No 12, December 1970, Abstract No 12A243P)

Translation: A photoelectron device is proposed which consists of a photomultiplier with a high resolution time and a resonator coupled with it, which has separate channels for input and output of the signal. With the object of an increase of the signal-to-noise ratio during reception of optical signals modulated in a narrow band of the microwave range, the anode input of the photomultiplier is introduced into the resonator cavity through an input channel and has the form of a loop.

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USSR

UDC 537.563:547.23

FRIDLYANSKIY, G. V., PAVLENKO, V. A., VINOGRADOV, B. A., GRISHIN, N. N., BOGOLYUBOV, G. M., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Organic Derivatives of Group V-VII Elements. XX. Exact Composition of Ions in Mass Spectra of Alkylphosphine Sulfides and P=S Bond Strength"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, pp 1707-1709

Abstract: The article describes results of the measurement of mass numbers of ions in mass spectra for triethylphosphine sulfide and tetraethyldiphosphine disulfide on a double-focusing mass spectrometer. The dissociation energy of the P-P bond in tetraethyldiphosphine disulfide was previously found by the authors from the appearance potential of the ion $(M/2)^+$. Precise measurement of the mass in the present article confirms the composition assigned to this ion. The dissociation energy of the P=S bond was found to be equal to 3.7 ev or 85 kcal/mole, which is in satisfactory agreement with the value obtained from the thermal effect of the tripropylphosphine oxidation reaction (91.6 kcal/mole). Determination of the exact composition of ions in the mass spectra of alkylphosphine sulfides shows the resistance of the P=S bond to the action of an electron impact. This resistance is characteristic of the chemical bonds between atoms of Group V and VI elements possessing unshared electron pairs.

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USSR

UDC 537.563:547.242

BOGOLYUBOV, G. M., GRISHIN, N. N., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Organic Derivatives of Group V-VII Elements. XXI. Mass Spectra of Trialkylarsines and Tetraalkyldiarsines. Effect of Alkyl Substitution on Bonding Strength of Adjacent Heteroatoms"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, pp 1710-1714

Abstract: The authors took mass spectra of triethyl-, tripropyl-, tributylarsines and tetraethyl-, tetrapropyl-, tetrabutyldiarsines and determined appearance potentials of the basic ions. The mass spectra of trialklylarsines and tetraalkyldiarsines display features characteristic of alkyl derivatives of Group V and VI elements of the thirs and higher periods, i.e. high intensity of molecular ions and predominance of ions formed with cleavage of E-C bonds as compared to ions formed with cleavage of E-E bonds (where E is an atom of a Group V or VI element possessing unshared electron pairs). A comparison of dissociation energies of E-Ebonds in alkyl derivatives with dissociation energies of diatomic molecules E_2 indicates that alkylation weakens the bond strength of adjacent heteroatoms.

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UDC 537.563:547.241

USSR

BOGOLYUBOV, G. M., GRISHIN, N. N., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Organic Derivatives of Group V-VII Elements. XVIII. Conjugation Energy of the P-P Bond. Mass Spectra of Phosphine Sulfides"

Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 4, Apr 71, pp 811-815

Abstract: The conjugation energy of the P-P bond in tetraethyldiphosphine was found to be of the order of 25 kcal/mole. Phosphorus atoms in this molecule have unshared pairs of electrons. Studying the electron spectra, dipole moments and the dissociation energy of the E-E type of compounds, where E= an element of the V, or VI group possessing and unshared pair of electrons, it was found that the conjugation between elements led to an increased resistance of the E-E bond to electron attack. Yet at the same time these compounds are highly susceptible to the action of nucleophilic agents. This phenomenon has been explained by an anti-ion participation in their chemical reactions.

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USSR UDC 537.563:547.341

BOGOLYUBOV, T. M., ZUBTSOVA, L. I., GRISHIN, N. N., RAZUMOVA, N. A., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Organic Derivatives of the V-VII Group Elements. XVII. Mass-Spectra of Phosphine Derivatives"

Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 3, Mar 71, pp 527-530

Abstract: Fragmented ions formed during mass-spectroscopical analysis of phosphines and phosphine oxides retain the positive charge on fragments containing heteroatoms. In this paper mass-spectra of phosphine oxides are reported, where this tendency does not exist. The spectra show high intensity of the molecular ion and fragmented hydrocarbon ions, in contrast to phosphates, phosphonates, and phosphine oxides. The predominance of fragmented hydrocarbon ions may be related to the presence of electron accepting substituents of the phosphorus atom. The intensity of the fragment ion m/e 54 correlates qualitatively with the activity of organophosphorus compounds in nucleophilic substitution reactions at the tetrahedral phosphorus atom.

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1/2 015 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--ABSOLUTE CONDENSATION PUMP -U-

AUTHOR-(03)-BOROVIK, YE.S., GRISHIN, S.F., GRISHINA, YE.YA.

COUNTRY OF INFO--USSR

SOURCE--ZH. TEKH. FIZ. 1970, 40(3) 581-6

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--HIGH VACUUM PUMP, CRYOGENIC LIQUID COOLING, GAS LIQUEFACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/1929 STEP NO--UR/0057/70/040/003/0581/0586

CIRC ACCESSION NO--AP0109258

UNCLASSIFIED

2/2 015 UNCLASSIFIED PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0108258

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONSTRUCTION OF AN ABS. CONDENSATION PUMP IS DESCRIBED. BY USING SUCH PUMPS WITH A TEMP. OF THE CONDENSING SURFACE OF 0.24DEGREESK, IT IS POSSIBLE TO OBTAIN A VACUUM OF 10 PRIME NEGATIVE12 WITH HE. FOR ACHIEVING LOWER VACUUMS, THE TEMP. OF THE SURFACE MUST BE DECREASED.

89

UNCLASSIFIED

USSR

GRISHIN, V. G.; et al (Joint Institute of Nuclear Research)

"Integral Equations of Cascade Kinematics"

Moscow, Yadernaya Fizika; October, 1970; pp 757-69

ABSTRACT: The authors consider the case in which the effective masses of two groups of particles from different branches of a cascade in cascade decays are measured. Two-dimensional distributions of these quantities are characterized by the internal structure: the lines of their levels are determined by the kinematics of a cascade (by conservation laws) and not by the spectrum of the effective mass of the whole particle system. A similar structure is also possible in two-dimensional energy distributions. The concept of the kinematical potential as a function of one variable determining two-dimensional distributions is introduced. Integral equations that allow one to determine the m_{eff} spectrum of the whole particle system without detecting all of the final products are derived. For instance, the spectrum $m(\pi^+\pi^-\pi^0)$ is reconstructed from the measurements of $m(\pi^+\pi^-\nu)$ and $m(\pi^+\pi^-)$ with the help of these equations.

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USSR

UDC 535.243.25

GRISHIN, V. G., Candidate of Technical Sciences, and RUSAKOV, L. A., Engineer

"Automatic Series-Connected Dynamic Spectrograph"

Moscow, Pribory i Sistemy Upravleniya, No 8, Aug 70, pp 19-21

Abstract: The described spectrograph applies the method of dynamic spectroscopy based on the production of a three-dimensional intense contour which is close to the contour of the amplitude momentary signal spectrum in time -- frequency -- intensity coordinates. In comparison with visual oscillographic and spectrographic methods, the described method is characterized by a more extensive applicability and improved quality in distinguishing complex acoustic signals. The resonance frequency and the damping of the filter, in the capacity of which is employed an analog model of oscillating circuit (AMOC), can be varied by simple means and according to any rule within a wide range. The selection of one of the spectrograph's seven frequency ranges (1—125; 2—250; 4—500; 8—1000; 16—2000; 32—4000; and 64—8000 hz) is realized through a change-over switch at the expense of variation of the amounts of two capacitances. An equal mean density of details on all parts of the representation is attained by equalizing the filter transmission band for all frequencies. The working principle of the

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USSR

GRISHIN, V. G., and RUSAKOV, L. A., Pribory i Sistemy Upravleniya, No 8, Aug 70, pp 19-21

spectrograph is illustrated in the flow sheet and the AMOC and transmitter diagrams. Numerical characteristics of the four AMOC amplifiers, developed by the Physics Faculty at Moscow State University, and the function of their voltage output variations are presented. The transmitter block serves as recipient of the signal modulating the beam brightness of the oscilloscope which is provided with a darkening system of the beam's backward run. The amplitude-frequency characteristic of the signal analyzer, that is to say, the dependence of the continuous voltage output on the frequency with constant signal amplitude at the input of the AMOC, represents a straight line outgoing from the origin of coordinates, as the quality factor of the contour increases linearly in relation to frequency. The dynamic amplitude characteristic of the spectrograph's through channel is practically linear in the range of 46 db; the dynamic range of the AMOC amounts to 70 db. The time required to get the dynamic spectrogram of a signal is $T = (t_s + t_d) \cdot n$, where t_s = signal duration, t_d = damping time of transients when switching the contour ($t_d \gtrsim 1$ sec), and $n = 125$ (number of lines). The device can be used to analyze heart defects by sound. Phonocardiagrams and dynamic spectrograms of heart sounds in mitral and aortic stenosis are shown.

2/2

1/2 022 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--ON REPRESENTATION OF PHASE INFORMATION IN PROBLEMS OF VISUAL ANALYSIS AND ON RECOGNITION OF COMPLEX ACOUSTIC SIGNALS BY OPERATOR -U-

AUTHOR-(02)-ANOKHIN, A.M., GRISHIN, V.G.

COUNTRY OF INFO--USSR

SOURCE--AVTOMATIKA I TELEMEKHANIKA, 1970, NR 3, PP 177-182

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ACOUSTIC SIGNAL, SIGNAL ANALYSIS, SPEECH SIGNAL, SPECTRUM ANALYZER, PHASE ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1456 STEP NO--UR/0103/70/000/003/0177/0182

CIRC ACCESSION NO--AP0106212

UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0106212
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERE IS DESCRIBED A DEVICE FOR A THREE DIMENSIONAL (BRIGHT) REPRESENTATION OF THE RELIEF OF THE DERIVATIVE OF THE PHASE INSTANTANEOUS SIGNAL SPECTRUM. THE PERSPECTIVENESS OF THE APPLICATION OF SUCH DEVICES TO THE PROBLEMS OF THE ANALYSIS AND THE CLASSIFICATION OF COMPLEX ACOUSTIC SIGNALS (SPEECH, PHONOCARDIOGRAMS, ETC.) IS SHOWN.

UNCLASSIFIED

USSR UDC 621.791.856.2.03

GUREVICH, S. M., NERODENKO, M. M., POVOD, A. G., TETERVAK, A. I., ASNIS, YE. A., Institute of Electric Welding imeni Ye. O. Paton, Academy of Sciences UkrSSR, GRISHIN, V. K., FERTIKOV, V. G., ESTRIN, V. N., LEVKOVICH, R. M., Moscow

"Equipment for Welding Chemically-Active Refractory Metals in a Controlled High Purity Helium Atmosphere"

Kiev, Avtomaticheskaya Svarka, No 8, Aug 70, pp 45-47

Abstract: A description is given of equipment for manual and automatic electric welding of refractory metals in a controlled atmosphere of high-purity helium. The equipment, which was developed at the Institute of Electric Welding imeni Ye. O. Paton, ensures continuous control of oxygen, nitrogen, and water vapor impurities and helium regeneration. It consists of a welding chamber with a vacuum system; 2) equipment for helium purification and 3) a helium purity control system. A photograph and schematic diagram of the installation are presented. The welding chamber (700 mm in diameter, volume, approximately 1000 l) is made of

USSR

GUREVICH, S. M., et al., Avtomaticheskaya Svarka, No 8, Aug 70, pp 45-47

1Kh18N9T steel. It is provided with a VN-1 suction pump, making it possible to obtain a 2 x 10-5 torr vacuum in the chamber with full load. A sorption method using activated carbon and zeolite at liquid nitrogen temperature at an absorber pressure of 150 atm is used for helium purification. A KhG-type gas chromatograph is used for helium purity control.

USSR

FILIPPOVICH, V. I., SHUMIKHIN, S. L., Scientific Research Institute for Physiology of Children and Adolescents, Academy of Pedagogical Sciences USSR, and GRISHIN, V. N., Moscow Institute of Energetics

"A Method for Research on Human Motor Behavior Under Changing (Stochastic) Conditions"

Moscow, Teoriya i Praktika Fizicheskoy Kul'tury, No 2, 1972, pp 66-69

Abstract: This method permits the study of human motor behavior under conditions which demand well-timed and precise movements of varying degrees of complexity for the purpose of learning how to increase man's ability to control his movements under various conditions. The method employs the following apparatus (fig. 1): The apparatus consists of two identical, independent assemblies, each containing two concentric rotating shafts, and a tensometric platform one meter square. The two assemblies, placed 2.5-3m apart, rotate two horizontal rods which serve as obstacles. The height and speed of the rods will depend on the parameters of the movement problem. The height of the lower rods is variable from 5cm to 1m, the upper, from 1-2m. The speed of rotation is variable from 10-120 rpm. A safety device protects the subject in the event of contact with any rod. The spatial

USSR

FILIPPOVICH, V. I., et al., Teoriya i Praktika Fizicheskoy Kul'tury, No 2, 1972, pp 66-69

parameters of the subject's movements are registered by a pickup which frequency modulates a signal generator according to capacitance changes between antennas (mounted on the rods) and the subject. The signal is detected, amplified, and recorded. The tensometric platform records reactive forces to an accuracy of 5kg. The sequence of rotation of the rods is determined by a program which may be changed during operation. An ink recorder (USCh-8) and oscillograph (K-105) are used for recording data. Measurement devices for collecting data to determine individual characteristics and adaptive behavior, as well as for data on normal bodily functions, may be simultaneously employed. The apparatus may be used for training.

GRISHIN, V.V.

JPRS 59661

31 July 1973

(5)

AUTOMATIC PYROMETER FOR MEASURING THE TRUE TEMPERATURE OF METALS ON THE BASIS OF RADIATION

[Article by D. Ya. Svet, V. V. Grishin, I. M. [illegible]', Yu. [illegible] [illegible], B. F. [illegible]kin, Russian, pp 339-343, no further information available]

The most important problem in the pyrometry of radiation is the measurement of the temperature of a body on the basis of radiation when the radiating capacity of the body changes during measurement.

We know that the solution to this problem is subject to difficulties of a theoretical nature and the only success that has been achieved thus far in solving it has involved radiators whose surfaces exhibit diffuse or mirror reflection that obeys the Lambert law. In these cases, the missing information on radiating capacity is obtained from the additional flux of radiant energy from a lateral source, reflected by the surface of the radiator [1,2]. Polarization of the radiation from a metallic mirror was used in [3,4] to obtain the missing information.

It has been shown [5] that within the limits of validity of the Drood formula the values for the true temperature can be determined by one of the methods of pyrometry on the basis of the relative distribution of spectral energy density of thermal radiation. However, the method can only be used at a relatively low temperature range. It has also been shown [6,8] that there are several new possibilities of measuring the true temperatures with changing radiating capacity, based on acquisition of additional information obtained directly from the flux of polychromatic radiation [9] on the basis of a new form of distribution of spectral density of Wien-Planck radiation [10].

It has been shown in these papers that although the values of the true temperature and radiating capacity cannot be determined directly from the value of the fluxes of intrinsic radiation, the view which is widely held in optical pyrometry concerning the impossibility of estimating separately from temperature the influence of the radiating capacity on the results of measurements of the flux of the temperature radiation itself is not always valid.

[I - USSR - L]

USSR UDC 620.186.1:621.785.53

GLUKHOV, V. P., and GRISHIN, YA. V., Volga Branch of the All-Union Scientific Research Institute of Abrasives and Grinding

"Structure and Phase Content of a Diffusion Titaniferous Layer"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 6, 1970, pp 64-65

Abstract: The investigation was made of the structure and phase content of a diffusion layer formed by alloying Armco iron (0.04% C) and St 3 (0.16% C) St 45 (0.44% C), St U8 (0.79%C) and St U10 (1.05%C) carbon steels with titanium. The diffusion saturation was conducted in titanium powder (80 micron) (98.4% Ti; 0.72% Mg) obtained from titanium sponge. The phase layer content was determined by metallographic and X-ray analysis and microhardness measurements. A possible mechanism of the formation of the diffusion layer is tentatively explained on the basis of the results obtained and previous data. The microstructure of the diffusion layer consists of an $FeTi_2$ outer layer with FeTi formations, usually concentrated around carbide inclusions. The absence of FeTi superstructure lines may be the result of either an insufficiently small difference in the intensity of titanium and the iron atomic scattering, or the absence of ordering in general. The FeTi phase drops out in the zone of the solid solution at cooling, as the result of a reduction in the solubility of titanium with decreasing temperature. 10 references.

1/1

USSR UDC: 533.6.011

RUDOY, B. P., GRISHIN, Yu. A.

"Gasdynamic Functions for One-Dimensional Isentropic Unsteady Flows"

Tr. Ufim. aviats. in-ta (Works of the Ufa Aviation Institute), 1970, vyp. 17, pp 23-29 (from RZh-Mekhanika, No 7, Jul 71, Abstract No 7B222)

Translation: Cases are considered where a one-dimensional translational flow of a perfect gas is decelerated in a simple rarefaction wave propagating in the same direction or in a simple compression wave going counter to the flow. Formulas are given which express the relative change of pressure, density, temperature, and speed of sound in the corresponding waves in terms of the Mach number in an undisturbed flow. Graphs are plotted for $\gamma = 1.4$.

Abstractor's note: The article contains no new results. The formulas presented in the article are a special case of formulas (40.10) given in the book by Courant and Friedrichs cited by the authors. No mention is made in the article of the fact that the computational formulas in the case of a simple compression wave are suitable only up to the moment of degeneration. G. Ya. Galin.

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Acc. Nr. AP0055672 — Abstracting Service: CHEMICAL ABST 5/70 Ref. Code NE 0000

105691r **Nuclear magnetic resonance spectroscopy of metal-cyclopentadienyls. IV. Carbon-13 NMR spectra of sigma cyclopentadienyl compounds of silicon, germanium, and tin.** Grishin, Yu. K.; Sergeev, N. M.; Ustynyuk, Yu. A. (NMR Lab., M. V. Lomonosov State Univ., Moscow, USSR). *J. Organometal. Chem.* 1970, 22(2), 361–4 (Eng). ^{13}C NMR spectra of Si, Ge, and Sn cyclopentadienyl compds. were studied. ^{13}C chem. shifts and $J(^{13}C\text{-}H)$ consts. verify the σ-structure of the compds. The variation of the ^{13}C NMR spectrum of $C_5H_5Ge(CH_3)_3$ with temp. shows that a fast metallotropic rearrangement occurs in this compd. at as low a temperature as 20°. ^{13}C NMR data are discussed with ref. to the structure of metal cyclopentadienyls. RCLC

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REEL/FRAME 19840981

74

USSR UDC 621.762.3

GRISHINA, A. I., MANTAROSHIN, A. P., PASHKOV, P. O.

"Structure and Certain Properties of Alloys Produced by Melting Mixtures of Metal Powders with Impact Loading"

Metallovedeniye i Prochnost' Materialov, T. 3 [Metal Science and the Strength of Materials, Vol 3 -- Collection of Works], Volgograd, 1971, pp 285-294, (Translated from Referativnyy Zhurnal, Metallurgiya, No 5, 1972, Abstract No 5 G470 by S. Krivonosova).

Translation: The regularities of formation of solid solutions of substitution in systems Cu-Ni and Fe-Ni are studied. The structure and properties of the melted zone with impact compression of mixtures of powders are determined by the shape of the state diagram of the components included in the mixtures. A high heating rate and brief impact loading result in the formation of nonequilibrium solid solutions in the melted zone with high contents of impurities in the lattice. 6 Figures; 3 Tables; 3 Biblio. Refs.

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USSR

UDC 621.762.001

GRISHINA, A. I., NOVIKOVA, L. V., RYADINSKAYA, I. M.

"Study of the Fine Structure of Specimens of Nickel Powder Produced by Impact Loading"

Metallovedeniye i Prochnost' Materialov, T. 3 [Metal Science and the Strength of Materials, Vol 3 -- Collection of Works], Volgograd, 1971, pp 309-314, (Translated from Referativnyy Zhurnal, Metallurgiya, No 5, 1972, Abstract No 5 G471 by S. Krivonosova).

Translation: An x-ray study is presented of specimens produced by impact loading. The level of strain hardening of various zones decreases upon transition from the surface to the center of the specimen. With impact loading, the temperature of the central portion of the specimen is increased significantly, leading to melting of the powder and full relief of strain hardening (increasing temperature resulting from intensity of plastic deformation of the powder). 4 Figures; 1 Biblio. Ref.

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USSR

UDC 621.762.3:669.2

GEDBERG, M. G., GRISHINA, A. I.

"Effect of Deoxidizing Additives and Preliminary Annealing During Impact Compacting of Iron Powder"

V sb. Metallovedeniye i prochnost' materialov. T. 3 (Physical Metallurgy and Materials Strength. Vol 3 -- collection of works), Volgograd, 1971, pp 294-302 (from RZh--Metallurgiya, No 4, Apr 72, Abstract No 4G407)

Translation: A study was made of the effect of complete reduction of Fe powder on the properties of briquettes obtained by impact compacting. Complete reduction of the powder reduces the hardness and increases the plasticity of the briquettes. Better results were obtained on complete reduction of the Fe-powder containing 0.1% C and 0.5% urea. Five illustrations, 1 table, and a 3-entry bibliography.

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USSR UDC: 51.621.391

GRISHINA, G. A.

"Formalization of Problems of Probabilistic-Automaton Modeling Based on a Specialized Algorithmic Language"

V sb. Veroyatnostn. avtomaty i ikh primeneniye (Probabilistic Automata and Their Use--collection of works), Riga, "Zinatne", 1971, pp 157-161 (from RZh-Kibernetika, No 9, Sep 71, Abstract No 9V417)

[No abstract]

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USSR

UDC 581.132.08

GRISHINA, G. S.

"The Use of the Amperometric Method for Determining Oxygen Exchange in Algae and Chloroplast Suspensions"

Moscow, Biofizicheskiye Metody v Fiziologii Rasteniy, Nauka, 1971, pp 34-43

Translation of Russian Abstract: A modified polarographic determination of the concentration of oxygen dissolved in a liquid is described in detail. The suggested method makes it possible to investigate photosynthesis and respiration of algae according to oxygen exchange and to study some reactions associated with oxygen exchange in isolated chloroplasts. A covered, pointed platinum electrode of the Clark type was used in the investigation. The basic features of the equipment setup are described: the volt-ampere curve, sensitivity, reproducibility, inertia, calibration of the electrode, and so on. The range of the applicability of the amperometric method for determining oxygen concentration in a closed system is specified.

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1/2 012 UNCLASSIFIED PROCESSING DATE--16OCT70

TITLE--INHIBITION OF PHOTOSYNTHESIS BY OXYGEN IN PLANTS CULTIVATED UNDER VARIOUS CONDITIONS OF NITROGEN SUPPLY -U-

AUTHOR-(03)-SLOBODSKAYA, G.A., GRISHINA, G.S., NICHIPOROVICH, A.A.

COUNTRY OF INFO--USSR

SOURCE--FIZIOLOGIYA RASTENIY, 1970, VOL 17, NR 2, PP 244-252

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--PHOTOSYNTHESIS, NITROGEN, OXYGEN, CARBON DIOXIDE, NITRATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1962/1598 STEP NO--UR/0326/70/017/002/0244/0252

CIRC ACCESSION NO--AP0052794

UNCLASSIFIED

2/2 012 UNCLASSIFIED PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0052794

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE LIGHT CURVES OF PHOTOSYNTHESIS AT OXYGEN TENSIONS OF 21 AND 3PERCENT WERE MEASURED IN PISUM SATIVUM, VICIA FABA, HELIANTHUS ANNUS AND NICOTIANA RUSTICA PLANTS CULTIVATED UNDER VARIOUS CONDITIONS OF NITROGEN SUPPLY. THE DEGREE OF INHIBITION DUE TO OXYGEN WAS APPROXIMATELY THE SAME AT VARIOUS LIGHT INTENSITIES BUT GREATLY DIFFERED BETWEEN THE SPECIES (13PERCENT IN H. ANNUS L. AND UP TO 44.5PERCENT IN N. RUSTICA L.). THE DEGREE OF INHIBITION WAS APPRECIABLY SMALLER IF THE PLANTS WERE ADEQUATELY SUPPLIED WITH NITROGEN OR IF THE CO SUB2 CONCENTRATION INCREASED, PROVIDING THESE FACTORS ENHANCED THE ACTIVITY OF THE PHOTOSYNTHETIC APPARATUS AND THE RATE OF PHOTOSYNTHESIS. AN O SUB2 CONCENTRATION OF 21PERCENT NOT ONLY SUPPRESSES PRIMARY FIXATION OF CO SUB2 BUT ALSO REDUCTION OF NITRATES.

FACILITY: K. A. TIMIRIAZEV INSTITUTE OF PLANT PHYSIOLOGY, USSR ACADEMY OF SCIENCES, MOSCOW.

UNCLASSIFIED

Acc. Nr: AP0047647 Abstracting Service: CHEMICAL ABST. 5/70 Ref. Code: UR 0080

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104437a **Hydrolysis of potassium metaphosphate.** Vol'fkovich, S. I.; Cherepanova, A. S.; Grishina, L. A. (USSR). *Zh. Prikl. Khim. (Leningrad)* 1970, 43(1), 3–9. (Russ). The acid hydrolysis of the polymeric $(KPO_3)_n$ was a 1st order reaction and proceeded from the end of the chain. The primary intermediates were orthophosphate and trimetaphosphate. The rate of hydrolysis increased with increasing temp. and decreasing pH; at pH = 2.75, the rate consts. were: $K_{50}° = 0.82 \times 10^{-2}$ min^{-1}, $K_{65}° = 0.25 \times 10^{-2}$ min^{-1}, and $K_{75}° = 0.59 \times 10^{-2}$ min^{-1}. The half life of $(KPO_3)_n$ in acidic media at 50, 65, and 75° was 14.1, 4.6, and 1.9 hr, resp. and the activation energy for the acid hydrolysis was 18,000 cal. The results of this investigation could be correlated to the agrochem. data for the rate of conversion of K metaphosphate into orthophosphate on various soils.
G. Melamed

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REEL/FRAME
19791221

18 OK

USSR

UDC 542.91:547.1'118

GRECHKIN, N. P., and GRISHINA, L. N., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of Sciences USSR

"Reaction of Ethyleniminocarbinols With Some Derivatives of Phosphorus Acids"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 8, Aug 73, pp 1883-1884

Abstract: The reaction of α-ethyleniminocarbinols with some phosphorus derivatives was investigated. Reacting β-trichloro-α-ethyleniminoethanol with dialkylphosphorous and glycolphosphorous acid chlorides yielded β-trichloro-α-ethyleniminoethyl esters of the respective acids.

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USSR

UDC 539.27

NAUMOV, V. A., SEMASHKO, V. N., ZAV'YALOV, A. P., CHERKASOV, R. A., and GRISHINA L. N., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of Sciences USSR, Kazan

"An Electron Diffraction Study of the Structure of the Molecules of Ethylene Chlorophosphate and Ethylene Chlorotrithiophosphate"

Moscow, Zhurnal Strukturnoy Khimii, Vol 14, No 5, Sep-Oct 73, pp 787-790

Abstract: On the basis of data obtained by an electron diffraction study carried out on ethylene chlorophosphate and its structural analog ethylene chlorotrithiophosphate (II; 2-thiono-2-chloro-1,3,2-dithiaphospholane) in the vapor state, the molecular structure of these compounds was determined. The five-membered heterocycle had a conformation of the semi-chair type in both cases. The molecular parameters for I were r(C-C) = 1.547 ± 0.020, r(C-O) = 1.488 ± 0.020, r(P=O) = 1.438 ± 0.015, r (P-O) = 1.616 ± 0.010, r(P-Cl) = 2.057 ± 0.010 Å; ∠ O-P-O = 104.7 ± 1.5°, ∠ O-P-Cl = 113.9 ± 2.0°, ∠ O-P-Cl = 101.3 ± 1.0°, ∠ C-C-O = 108.2 ± 1.0°; those for II r(C-C) = 1.525 (assumed), r(C-S) = 1.879 ± 0.010, r(P=S) = 1.885 ± 0.020, r(P-S) = 2.123 ± 0.010, r(P-Cl) = 2.006 ± 0.015 Å; ∠ S-P-S = 98.4 ± 1.5°, ∠ S-P-C = 113.2 ± 2.0°, ∠ S-P-C = 104.2 ± 1.0°, ∠ C-C-S = 112.9 ± 2.5°.

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USSR

UDC 542.91:547.1'118

GRECHKIN, N. P., and GRISHINA, L. N., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of Sciences USSR Kazan'

"Pyrrolidides of Phosphorus Acids"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 7, Jul 73, pp 1670-1671

Abstract: Research on organophosphorus derivatives of pyrrolidine with the purpose of synthesizing physiologically active compounds was continued. By reacting 2-chloro-1,3,2-dioxaphospholanes and -phosphorinanes with pyrrolidine in the presence of Et_3N, 2-pyrrolidido-1,3,2-dioxaphospholanes and-phosphorinanes were obtained. The reaction of these compounds with chloralhydrate was accompanied by opening of the P-containing ring and a Perkov rearrangement. As a result, formation of chloroalkyl di-beta, beta-chlorovinyl N-pyrrolididophosphates took place. The pyrrolididophosphates had antifungal activity towards dermatophytes. The physical properties of the compounds prepared are listed in tables.

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USSR

UDC 542.91+661.718.1

GRECHKIN, N. P., and GRISHINA, L. N., Institute of Organic and Physical Chemistry Imeni A. Ye. Arbuzov, Academy of Sciences, USSR

"Phosphonaminoethylation of Spirophosphoranes"

Moscow, Izvestiya Akademii Nauk, Seriya Khimicheskaya, No 7, Jul 70, pp 1644-1646

Abstract: A mixture of 3 g of 1,4,6,9-tetraoxa-5-phosphaspiro-(4,4)-nonane, 4.6 g ethyleneaminde of diisobutylphosphoric acid and about 0.1 g of ammonium chloride was heated in a sealed tube at 120-170° for 18 hrs to yield after distillation 5-(N-β-diisobutylphosphonamino)-ethyl-1,4,6,9-tetraoxa-5-phosphaspiro-(4,4)-nonane, b.p. 143-146°/0.1mm d_4^{20} 1.1508, n_D^{20} 1.4580. Following alkyl analogues were obtained similarly: alkyl derivative, b.p.°C/mm Hg, d_4^{20}, n_D^{20} given: n-propyl, 125-126/0.3, 1.2015, 1.4560; i-propyl, 146-147/0.3, 1.1731, 1.4625; n-butyl, 133-135/0.4, 1.1564, 1.4572; and i-pentyl, 182-184/0.6, 1.1322, 1.4620.

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USSR

UDC 669.14.018.23

KOZHIN, V. M., KARPOV, A. G., OPANASENKO, T. V., GRISHINA, N. A., and YEROFEYEV, V. I.

"EP378 High-Strength Automatic Stainless Steel"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 10, 1970, pp 25-27

Abstract: A new high-strength automatic stainless steel, type EP378 (0.35-0.45% C; 0.6-1.0% Mn; 1.7-2.2% Ni; 0.6-0.9% Mo; 16.5-18.5% Cr; 0.15-0.25% S; 0.08-0.15% P), is desribed. The new steel has superior physical and mechanical properties to types Kh14, 1Kh18N10Ye, and EI474. The steel is designed for parts of instruments working in friction which must have hardness HRC $\geq$ 48. The critical points for EP378 steel, determined dilatometrically, are: Ac_1 = 750°C; Ac_3 = 820°C; M_n = 220°C. The steel has maximum hardness when hardened from 1040-1060°C. The influence of tempering on mechanical properties is studied. The mechanical properties of the steel are: tensile strength 168-175 kg/mm^2, $\sigma_{0.2}$ = 140-145 kg/mm^2, δ = 8-10%, ψ = 15-17%, a_n = 1.0-1.8 kgm/cm^2, HRC = 48-52. Heat treatment modes are discussed.

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USSR UDC: 548.4

BELYATSKAYA, N. S., GRISHINA, S. P., LOPATIN, Ye. P., MIL'-VIDSKIY, M. G., OSVENSKIY, V. B., POMIN, V. G., State Scientific Research and Design Institute for the Rare Metals Industry

"Structural Singularities of Gallium Arsenide Single Crystals Heavily Doped With Donor Impurities"

Moscow, Kristallografiya, Vol 17, No 1, Jan/Feb 72, pp 158-165

Abstract: A study is made of the effect which tellurium, selenium, and sulfur doping has on the degree of perfectness of GaAs single crystals. Metallographic and radiographic studies show that doping to high concentrations with donor impurities ($n > 10^{18}$/cc) may lead to an appreciable reduction in the dislocation density and to a specific distribution in the volume of the GaAs single crystals due to strengthening of the material and intensification of the process of dislocation creep during doping. Nonhomogeneous dopant distribution in heavily doped single crystals is an additional source

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BELYATSKAYA, N. S. et al., Kristallografiya, Jan/Feb 72, pp 158-165

of dislocations. Structural investigations show that in the process of growing gallium arsenide single crystals heavily doped with donor impurities, partial decomposition of supersaturated solid solutions takes place, accompanied by the development of additional internal stresses and a lumped structure within the crystal. Five figures, one table, bibliography of eleven titles.

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USSR

UDC 547.241

GRISHINA, O. N., KOSOVA, L. M., and KLYUCHANSKAYA, S. M., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Acad. of Sci. USSR

"Alkylthionophosphine Sulfides. Part XII. Reactions of Alkylthionophosphine Sulfides With Organomagnesium Compounds"

Leningrad, Zhurnal Obshchey Khimii, Sep 71, Vol 41, No 9, pp 1995-1999

Abstract: The principal reaction products of alkylthionophosphine sulfides with organomagnesium compounds are dialkyldithiophosphinic acids. The reaction in addition the principal product also yields mercaptans, trialkylphosphine sulfides and oxygen-containing phosphorus acids. The yield of these byproducts is 40-60%. The reaction losses are considerable (20-30%) and are assumed to be due to the oxygen-containing phosphorus acids which are lost during the hydrolysis of the complex. The formation of trialkylphosphine sulfide is related to the mobility of zinc sulfur in the sulfide which, as shown in an earlier study, splits from phosphorus to form a new sulfur-containing compound, in this case, possibly a mercaptan. Distillation of dialkyldithiophosphinic acids under vacuum, followed by the elimination of hydrogen sulfide, results in the formation of

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GRISHINA, O. N., et al:, Zhurnal Obshchey Khimii, Sep 71, Vol 41, No 9, pp 1995-1999

thioanhydrides of these acids. Identification of the new compounds was based on elemental analysis, physicochemical constants and IR spectra.

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USSR UDC: 547.241+661.725

GRISHINA, O. N., KOSOVA, L. M., LIPATOVA, I. P., and SHAGIDULLIN, R. R., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan', Academy of Sciences USSR

"Alkylthiophosphine Sulfides. 9. Synthesis of Pentaerythrityl 0,0,0,0-Tetrakis (Alkyldithiophosphonates) and Their Derivatives"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 1, Jan 70, pp 66-69

Abstract: A series of dithiophosphonate derivatives, previously unknown, were synthesized in the pursuit of investigation of alkylthiophosphine sulfides (I). Four partial esters, pentaerythrityl 0,0,0,0-tetrakis(alkyldithiophosphonates) (II), were prepared in 100% yields by mixing I with pentaerythritol in anhydrous dioxane at 90°. II were clear viscous products. Dropping triethylamine slowly into a mixture of I and pentaerythritol in dioxane at room temperature, then heating the mixture to 70° gave corresponding quaternary triethylammonium salts of II (III) (yields 92-97%), clear viscous substances which crystallized on standing. Adding slowly ethyl iodide or ethyl chloroacetate to III in dioxane at 70-80° gave after three hours 66-89% yields of pentaerythrityl 0,0,0,0-tetrakis (S-dialkyldithiophosphonates), extremely viscous substances which crystallized on standing. Similarly III in dioxane

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GRISHINA, O. N., et al, Zhurnal Obshchey Khimii, Vol 40, No 1, Jan 70, pp 66-69

solution reacted with aqueous iodine at room temperature to give 78.8-94.8% yields of disulfides

$$C[(CH_2OP(S)R\text{-}S\text{-})_2]_2$$

where R is butyl, cyclohexyl, or C_6H_{13}. The disulfides IV were crystalline products, indentified by their melting points. Shaking II, where alkyl is butyl or cyclohexyl, with aqueous nickel sulfate in equimolar amounts gave 100% yields of corresponding nickel salts, gray-greenish powders melting at 145-147° and 230-33°, respectively.

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USSR

UDC 538.113 + 541.49 + 661.718.1 + 546

SOLOZHENKIN, P. M., KOPITSYA, N. I., and GRISHINA, O. N., Institute of Chemistry, Academy of Sciences TadzhSSR

"EPR of the Divalent Copper O-Alkyl Alkyldithiophosphonate Solutions"

Moscow, Zhurnal Strukturnoy Khimii, Vol 12, No 1, Jan-Feb 71, pp 167-170

Abstract: Complexes between divalent copper and O-alkyl alkyldithiophosphonates (I) were obtained by treating copper sulfate in aqueous solution with the appropriate phosphonic acid in organic solvents. When the complexes were studied in different solvents at room temperature, no effect was noted on the EPR spectra. The superfine structure and complimentary superfine structure from the interaction of copper and phosphorus atoms was analyzed and contrasted with the structures of dithiophosphates and dithiophosphinates. Considerable dislocation of the unpaired electron is observed in (I) which results in the interaction with P^{31}. The bonding to copper is of a covalent character.

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1/2 022 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--INFLUENCE OF METAL O,ALKYLALKYLDITHIOPHOSPHONATES ON THE PROPERTIES OF LUBRICANTS -U-

AUTHOR-(02)-GRISHINA, O.N., POTEKHINA, M.I.

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COUNTRY OF INFO--USSR

SOURCE--NEFTEKHIMIYA 1970, 10(2), 297-302

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--ANTIOXIDANT ADDITIVE, LUBRICANT ADDITIVE, PHOSPHATE ESTER, ZINC COMPOUND, BARIUM COMPOUND, THIOL, NICKEL COMPOUND/(U)MS20 LUBRICANTING OIL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3005/1964 STEP NO--UR/0204/70/010/002/0297/0302

CIRC ACCESSION NO--AP0133808

UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0133808
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ZN, BA, AND NI O,ALKYL ALKYLDITHIOPHOSPHONATES ARE OXION. INHIBITORS FOR OILS. ZN AND BA SALTS DECREASED THE CORROSIVITY OF MS-20 OIL. METAL DITHIOPHOSPHATES WERE LESS EFFECTIVE THAN THE DITHIOPHOSPHONATES. NI SALTS WERE MORE ACTIVE ANTIOXIDANTS THAN ZN SALTS AT 150DEGREES, BUT LESS ACTIVE AT 170-200DEGREES. BRANCHING IN THE ZLKYL CHAIN INCREASED EFFECTIVENESS, BUT THE CHAIN LENGTH HAD NO EFFECT ON THE ANTICORROSION ACTIVITY. AT LARGER THAN 140DEGREES, THE ANTICORROSION ACTIVITY OF THE SALTS DECREASED. FACILITY: INST. ORG. FIZ. KHIM. IM. ARBUZOVA, KAZAN, USSR.

UNCLASSIFIED

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002201020012-1"

1/2 024 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--SULFIDES OF ALKYLTHIONOPHOSPHINES. IX. SYNTHESIS OF PENTAERYTHRITOL,O,O,O,O,TETRAKIS,ALKYLDITHIOPHOSPHONATES, AND THEIR

AUTHOR-(04)-GRISHINA, O.N., KOSOVA, L.M., LIPATOVA, I.P., SHAGIDULLIN, R.R.

COUNTRY OF INFO--USSR

SOURCE--ZH. OBSHCH. KHIM. 1970, 40(1), 66-9

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CHEMICAL SYNTHESIS, HETEROCYCLIC OXYGEN COMPOUND, IR SPECTRUM, ORGANONICKEL COMPOUND, PHOSPHATE ESTER, HETEROCYCLIC SULFUR COMPOUND, HETEROCYCLIC PHOSPHOURS COMPOUND, THIOL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/1739 STEP NO--UR/0079/70/040/001/0066/0069

CIRC ACCESSION NO--AP0112727

UNCLASSIFIED

2/2 024 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0112727

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HEATING 5 G (MEETCHPS SUB2) SUB2 WITH 2.24 G C(CH SUB2 OH) SUB4 IN DRY DIOXANE 1 HR AT 90DEGREES GAVE 100PERCENT VISCOUS C(CH SUB2 OP(S)-(SH)R) SUB4 (I) (R EQUALS MEETCH), N PRIME20 SUBD 1.5630. SIMILARLY WERE PREPD. THE ANALOGS WITH: SHOWN ON MICROFICHE. IR SPECTRA ARE REPORTED. FACILITY: INST. ORG. FIZ. KHIM. IM. ARBUZOVA, KAZAN, USSR.

UNCLASSIFIED

Lubricants and Lubrication

USSR UDC: 547.86'118'118-36:665.6

GRISHINA, O.N., and POTAPKINA, M.I., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of Sciences USSR, Kazan'

"Effects of Metal O-Alkyl-alkyldithiophosphonates on the Properties of Lubricating Oil"

Moscow, Neftekhimiya, Vol 10, No 2, Mar-Apr 70, pp 297-303

Abstract: A study was carried out of the antioxidant and anticorrosion effects of O-alkyl-alkyldithiophosphonates $/R(R_1O)P(S)S/_2M$ added to oil, in which R were normal and branched alkyl groups in the range up to C_8, R_1 normal and branched alkyl groups in the range up to C_8 and $n\text{-}C_{18}H_{37}$, and M - Ni, Zn, Ba. In tests on liquid petrolatum in the presence of Mn stearate, the antioxidant activity of these compounds decreased in the order Ni Zn Ba at 150°, increased with an increasing chain length of R_1, increased when both R and R_1 were branched, and decreased with increasing temperatures in the 150-200° range. At 150° Ni salts were more active than Zn salts, while at 170-200° this relation was reversed because of the higher stability of Zn vs. Ni salts. Comparison of $/Ba(iso\text{-}C_8H_{17}O)P(S)S/_2Zn$ (I) with DF-11-I (Zn iso-octyl-Ba-dithiophosphate, II) and $/Ba(Ph)P(S)S/_2Zn$ (III) showed that the antioxidant activity increased in the order II I III. In anticorrosion tests carried out with the oil MS-20 in the presence of Mn stearate, Zn O-alkyl-alkyldithiophosphonates protected a Pb surface against

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GRISHINA, O.N., et al, Neftekhimiya, Vol 10, No 2, Mar-Apr 70, pp 297-302

corrosion more effectively than the corresponding Ba salts, while Ni salts had no protective effect. The activity of compounds which showed an anticorrosion effect was on the same level as that of DF-11 and Santolube-493. The O-octadecyl-octyldiphosphonates of Ni and Zn, which did not contain S, increased the corrosive effect produced by the oil in the tests. The anticorrosion activity of the compounds tested decreased with increasing temperatures in the 150-190° range.

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USSR UDC 548.4

MIL'VIDSKII, M. G., OSVENSKII, V. B., NOVIKOV, A. G., FOMIN, V. G., GRISHINA, S. P., Government Scientific-Research and Planning Institute for the Rare Metals Industry

"Effect of Thermal Processing on the Ideal Structure of Monocrystals of Gallium Arsenide Alloyed with Tellurium

Moscow, Kristallografiya, vol 18, No 4, July-August 1973, pp 826-829

The effect of thermal processing (1100°C, 700°C, up to 50 hr) on the physical properties of gallium arsenide containing 10^{19} tellurium atoms per cubic centimeter was studied by selective chemical etching, measurement of the Hall effect, two-crystal spectrometry, diffraction topography, and precision measurements of the lattice. The electrical properties and monocrystal structural data indicate a destruction of the supersaturated solid solutions with formation of a second phase.

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GRISHINA, S.P

III-2. STUDY OF THE EFFECT OF THE DEVIATION OF THE COMPOSITION FROM THE STOICHIOMETRY AND THE CRYSTALLOGRAPHIC DIRECTION OF GROWTH ON THE DISLOCATION STRUCTURE OF SINGLE GALLIUM ARSENIDE CRYSTALS

[Article by S. P. Grishina, M. G. Milvidskiy, V. B. Osvenskiy, V. F. Pavlov, V. G. Fomin, Moscow; Soveshchaniye po Protsessam Rosta i Svoystvam Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June, 1972, p 26]

It was demonstrated that during the growth from a melt, the deviation of the composition from the stoichiometry can have an effect on the dislocation structure of gallium arsenide single crystals both through the crystallization process and by creating additional dislocation sources in the material which has already been crystallized. In the first case the deviation of the composition of the melt from stoichiometry can lead to destruction of the stability of the smooth crystallization front under the conditions of concentration supercooling which is expressed in the formation of the low-angle boundaries and the cellular structure. This effect is exhibited most clearly when growing a crystal in the [100] direction and with a small magnitude of the axial temperature gradient at the crystallization front. In the second case the deviation of the composition from stoichiometry has an effect on the formation of the dislocations in the crystal under the effect of thermal stresses. It was established that the deviation from stoichiometry in the direction of excess gallium in the surface layers of the crystal leads to more intense generation of the dislocations where the deviation in the direction of the excess arsenic has the opposite effect by comparison with the stoichiometric composition. For growth under conditions of identical stoichiometry of the melt, a noticeable effect of the growth direction on the dislocation density in the crystal was not observed. This is confirmed by the results of calculating the thermal stress field. Using the x-ray diffraction topography, a study was made of the types of dislocations in the single crystals expressed in various crystallographic directions.

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1/2 031 UNCLASSIFIED PROCESSING DATE--16OCT70

TITLE--HEAT TREATMENT TRANSFORMATIONS IN GALLIUM ARSENIDE STRONGLY DOPED WITH TELLURIUM -U-

AUTHOR-(04)-GRISHINA, S.P., MILVIDSKIY, M.G., OSVENSKIY, V.B., FISTUL, V.I.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(2), 294-8

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--METAL HEAT TREATMENT, GALLIUM ARSENIDE, DOPED ALLOY, TELLURIUM, HALL CONSTANT, CRYSTAL DISLOCATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1995/0940 STEP NO--UR/0449/70/004/002/0294/0298

CIRC ACCESSION NO--AP0116448

UNCLASSIFIED

2/2 031 UNCLASSIFIED PROCESSING DATE--16OCT70
CIRC ACCESSION NO--AP0116448
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TE DOPED GAAS SINGLE CRYSTALS DOPED WITH SUFFICIENT TE TO GIVE A CHARGE CARRIER CONCN. OF (7-10) TIMES 10 PRIME18-CM PRIME3 AND DISLOCATION D. SIMILAR TO 10 PRIME3-CM PRIME2 WERE GROWN BY THE CZOCHRALSKI METHOD. THE HEAT TREATMENT WAS CARRIED OUT IN EVACUATED QUARTZ AMPULS. THE CARRIER D. AND MOBILITY WERE DETD. FROM HALL COEFF. AND COND. MEASUREMENTS OF CROSS SHAPED SAMPLES. ANNEALING WAS PERFORMED AT 700-1000DEGREES AFTER TEMPERING AT 1100DEGREES. FOLLOWING THE TEMPERING PROCEDURE ALL SAMPLES SHOWED AN 40-60PERCENT INCREASE OF ELECTRON CONCN. A GENERAL DECAY OF N SUBE IS OBSERVED THROUGHOUT THE ENTIRE ANNEALING PROCESS (SIMILAR TO 100-150 HRS.) AT EACH ANNEALING TEMP. THE INITIAL N SUBE VALUE PRIOR TO TEMPERING IS REACHED WITHIN 20 MIN DURING THE ANNEALING PROCESS REGARDLESS OF TEMP. AT HIGHER COOLING RATES AS THOSE MET UNDER USUAL CRYSTN. CONDITIONS THE IMPURITIES REDISTRIBUTION CANNOT PROCEED, AND THE CRYSTAL REMAINS IN A METASTABLE STATE. THE DECAY OF N SUBE DURING ANNEALING IS ATTRIBUTED TO A TRANSITION OF PART OF THE TE ATOMS INTO INTERSTITIAL POSITIONS OR TO AN INCLUSION INTO A SECOND PHASE. A DECREASE IN ELECTRON MOBILITY IS CAUSED BY THE ANNEALING PROCESS. IT IS ASSUMED THAT TE ATOMS IN THE SECOND PHASE FORM MULTICHARGE COMPLEXES. UNDER ISOTHERMAL CONDITIONS AT GREATER THAN 800DEGREESC THE TRANSFORMATION PROCEEDS IN 2 STAGES. DURING THE FIRST 20 MIN A METASTABLE TE COMPLEX IS FORMED, WHICH IS THEN DISSOLVED AND A SECOND COMPLEX APPEARS, EVENTUALLY WITH THE FORMATION OF A FINELY DISPERSED SECOND PHASE. FACILITY: GOS. NAUCH.-ISSLED. PROEKT. INST. REDKOMETAL. PROM., MOSCOW, USSR.
UNCLASSIFIED

1/3 017 UNCLASSIFIED PROCESSING DATE--16OCT70

TITLE--STRUCTURAL FEATURES OF SILICON SINGLE CRYSTALS STRONGLY DOPED WITH ARSENIC -U-

AUTHOR-(04)-GRISHINA, S.P., KLIMOVA, N.M., OSYENSKIY, V.B., MILVIDSKIY, M.G.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(2) 193-5

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, MATERIALS

TOPIC TAGS--SILICON SINGLE CRYSTAL, DOPED ALLOY, ARSENIC CONTAINING ALLOY, SOLID SOLUTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/0821 STEP NO--UR/0363/70/006/002/0193/0195

CIRC ACCESSION NO--AP0118002

UNCLASSIFIED

2/3 017 UNCLASSIFIED PROCESSING DATE--16OCT70
CIRC ACCESSION NO--AP0118002
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN ELECTRONMICROSCOPE STUDY WAS MADE OF THE STRUCTURE OF SI SINGLE CRYSTALS DOPED WITH AS TO A CONCN. OF 5 TIMES 10 PRIME20-CM PRIME3. THE CRYSTALS WERE GROWN BY THE CZOCHRALSKI TECHNIQUE IN THE MEAN VALUE OF 111 DIRECTION. THE SAMPLES WERE SECTIONED BOTH IN TRANSVERSE AND IN LONGITUDINAL CROSS SECTION, COINCIDING WITH THE (110) PLANE. ELECTRON REPLICATION AND THIN FILM ELECTRON TRANSMISSION TECHNIQUES WERE USED. FOUR SYSTEMS OF PARALLEL GROWTH BANDS WITH PERIODS OF SIMILAR TO 100, SIMILAR TO 40, SIMILAR TO 10, AND SIMILAR TO 2 MU WERE OBSERVED ON LONGITUDINAL SECTIONS. FINER BANDS, WITH PERIODS OF SMALLER THAN OR EQUAL TO 0.1 MU, WERE OBSD. INSIDE THE SIMILAR TO 2 MU BANDS. THE PRESENCE OF PERIODIC HETEROGENEITY IN CRYSTALS IS GNERALLY ASSOCD. WITH PERIODIC CHANGE OF GROWTH RATE. THE PRESENCE IN THE CRYSTALS OF A WHOLE SPECTRUM OF FINE GROWTH BANDS ATTESTS TO THE COMPLEXITY OF THE PROCESSES TAKING PLACE AT THE CRYSTN. FRONT. IN THE MIDDLE PART OF THE CRYSTALS THERE IS A "GATHERING" OF FINE GROWTH BANDS INTO WINDER ONES. A DISCRETE STRUCTURE OF THE CELLS WAS OBSD. IN THE SAMPLES ALONG WITH THE GROWTH BANDS. THE BOUNDARIES OF THE CELLS LOOK LIKE THIN GROOVES (SIMILAR TO 4 MU), INTERSECTING THE GROWTH BANDS IN THE MEAN VALUE OF 110 DIRECTIONS. PPTS. MEASURING SIMILAR TO 10 PRIME3 ANGSTROM IN SIZE WERE OBSD., INTO THE COMPN. OF WHICH ENTERS THE DOPING IMPURITY. THE MOST PROBABLE REASON FOR THE FORMATION OF SUCH FINELY DISPERSED PPTS. IS THE PARTIAL DECOMPN. OF THE SOLID SOLN. OF AS AND SI DURING COOLING OF THE CRYSTAL FROM THE M.P.

UNCLASSIFIED

3/3 017 UNCLASSIFIED PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0118002

ABSTRACT/EXTRACT--THERE ARE NO DATA IN THE LITERATURE ON THE SOLY. OF AS IN SI WITHIN A WIDE TEMP. RANGE.

UNCLASSIFIED

USSR

UDC: 546.28:543.55

GRISHINA, S. P., KLIMOVA, N. M., OSVENSKIY, V. B., and MIL'VIDSKIY, M. G., Giredmet (State Scientific Research and Planning Institute of the Rare Metals Industry)

"Structural Features of Silicon Single Crystals Highly Doped with Arsenic"

Moscow, Neorganicheskiye Materialy, Vol 6, No 2, Feb 70, pp 193-195

Abstract: An electron microscopy study of arsenic-doped silicon crystals, grown by the Chokhralski method, revealed growth zones with a period of up to 1 micron. A study with the replica method established that the cell and growth zones have a discrete structure. Segregations measuring $\sim 10^3$A containing the alloying addition were detected. The partial decomposition of the solid solution of arsenic in silicon, during the cooling of the crystal from its melting temperature, may be responsible for the formation of such finely dispersed segregations. There is a lack of information, however, in the literature on arsenic solubility in silicon over a wide temperature range; the appreciable stability of the segregations with respect to thermal effects cautions against univalued views regarding their nature. Further studies are essential.

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USSR

GRISHINA, T. A., STOYANOVA, I. G.

"Effect of Object Thickness on Electron Microscope Image Quality"

Moscow, Izvestiya Akademii Nauk, Seriya Fizicheskaya, Vol 34, No 7, 1970, pp 1408-1415

Abstract: In an electron lens system with aberration the electons emerging from the object are not concentrated at a single point but are distributed over a circle whose center is connected with the image point. The distribution law for the intensity in this circle is a function of the radius and is determined by the electron-optical parameters of the image-forming system as well as the angular and energy distribution of the electrons forming the image. The authors find an expression for the intensity distribution in terms of the angular distribution of electron brightness emerging from the image of the point of the object and the average energy distribution of the electrons forming the image of the point. They also obtain an empirical formula for the resolution of the electron microscope image which takes into account the electron-optical parameters of the image-forming system and the dispersion characteristics of the electrons in the 1/1 object.

USSR

UDC 8.74

GRISHINA, T. M., PIRIN, S. I., SEREBRYAKOV, V. A.

"YaRUS Expanded Programming System"

V sb. Teoriya yazykov i metody postroyeniya sistem programmir. (Language Theory and Methods of Constructing Programming Systems--collection of works), Kiev-Alushta, 1972, pp 181-189 (from RZh-Kibernetika, No 12, Dec 72, Abstract No 12V462)

Translation: A programming system is described which offers the possibility for the user to have the expansions he requires by introducing new syntactic structures, defining new data structures and new operations. The base for the system is the so-called expanded language the construction of which is an iterative process. Its origin is a language λ_0. In the k + 1 step of the process, the language λ_{k+1} described by means of the language λ_k is generated.

The process continues until the language is obtained with the required means of expression. In the initial state the YaRUS system comprises two languages: the TsYeNTR and the process control language. The TsYeNTR language is the base language: from this language the expansion process begins. Its base is the BCL language developed at the London Institute of Computer Engineering. The program in the TsYeNTR language comprises a series of procedures each of which includes a heading and a body. The heading, in turn, comprises the names and

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USSR

GRISHINA, T. M., et al., Teoriya yazykov i metody postroyeniya sistem programmir., Kiev-Alushta, 1973, pp 181-189

attributes of the name. The attributes of the name are the descriptor of the title procedure and the list of formal parameters. The body of the procedure is the module comprising the sequence of tagged elements separated by the symbol ";." The element can be a module, an alternative, a controller, the procedure call, the operator and the description. The control language is used to control the processes taking place in the system. The instructions of this language are divided into the general instructions of the TEST type and the instructions giving the operating mode of the system. The general instructions are used to initiate the problem in the system, completion of operation of the system, control of the communications channels, and calling the archive. The instructions of the TEST type are traditional instructions of the operation with an archive. The operating mode instructions provide for operation of the system in one of three modes: expansion, compilation and execution.

USSR

UDC 632.95

YUKHTIN, N. N., KOLCHANOV, A. V., KELEKHSAYEVA, YE. A., BAZANOVA, S. S., LEBEDEVA, L. I., GRISHINA, YE. A., and PRESNYAKOVA, S. N.

"Propanid -- A Highly Effective Herbicide for Weed Control in Rice Paddies"

V sb. Khim. sredstva zashchity rast. (Chemical Plant Protectants -- collection of works), vyp 1, Moscow, 1970, pp 156-163 (from RZh-Khimiya, No 13, 10 Jul 72, Abstract No 13N514 by. O. A. Korotkova)

Translation: As a result of a study of propanid yield dependence on the solvent, reactant molar ratios and crystallisation conditions, it is suggested that propanid be obtained by acylation of $3,4\text{-}Cl_2C_6H_3NH_2$ [illegible] in a petroleum solvent medium at a $3,4\text{-}Cl_2C_6H_3NH_2$ and solvent ratio of 1:0.5. The reaction is conducted for 12-15 hours with stirring and at 140-160°, distilling the aqueous azeotrope at 90-95° at the beginning of the process, and 135° at the end. The unreacted starting materials are recycled. The resultant propanid has a purity of 98.5-99.5 percent, melting point 89-91°, yield 83-98 percent.

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1/2 015 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--ABSOLUTE CONDENSATION PUMP -U-

AUTHOR-(03)-BOROVIK, YE.S., GRISHIN, S.F., GRISHINA, YE.YA.

COUNTRY OF INFO--USSR

SOURCE--ZH. TEKH. FIZ. 1970, 40(3) 581-6

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--HIGH VACUUM PUMP, CRYOGENIC LIQUID COOLING, GAS LIQUEFACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/1929 STEP NO--UR/0057/70/040/003/0581/0586

CIRC ACCESSION NO--AP0104258

UNCLASSIFIED

2/2 015 UNCLASSIFIED PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0108258

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONSTRUCTION OF AN ABS. CONDENSATION PUMP IS DESCRIBED. BY USING SUCH PUMPS WITH A TEMP. OF THE CONDENSING SURFACE OF 0.24DEGREESK, IT IS POSSIBLE TO OBTAIN A VACUUM OF 10 PRIME NEGATIVE12 WITH HE. FOR ACHIEVING LOWER VACUUMS, THE TEMP. OF THE SURFACE MUST BE DECREASED.

89

UNCLASSIFIED

GRISHKEVICH L.V.

RAD / [illegible] / 5-MAY-73

62

Since the tests were conducted at various times of day and orbital inclinations, the authors point out that their data indicate the spatial and time variation in the magnetosphere channel.

Benediktov, Ye. A., L. V. Grishkevich, and V. I. Ivanov, Simultaneous measurement of electron concentration and collision frequency in the ionospheric D-region using a partial reflections method, IVUZ Radiofiz, no. 5, 1972, 695-702.

In a related earlier work the authors described initial results in measuring electron density N in the D-layer by obtaining the correlation coefficient between backscatter of the ordinary and extraordinary wave components (IVUZ Radiofiz, no. 9, 1971, 1452). In that paper the feasibility of simultaneously determining the collision frequency ν_m from the same data was postulated; in the present article this is verified theoretically and experimentally. The analysis assumes a rectangular transmitted pulse τ at frequency ω and a sufficiently directional beam so that, neglecting absorption in the scattering medium, the correlation coefficient for both wave components may be found from

$$\rho_{x,o} = \frac{\sin^2 X}{X^2}, \qquad (1)$$

where $X = kL(\mu_o - \mu_x)$; μ_o and μ_x are refractive indices of the ordinary and extraordinary components; $L = c\tau/2$; and $k = \omega/c$.

Graphical results of ρ (N) are presented for an assumed set of ν_m based on Eq. (1), and calculated for transmitted frequencies of 3 and 5.75 MHz. It is shown that with the assumed simplifications

USSR UDC: 551.510.535

BENEDIKTOV, Ye. A., GRISHKEVICH, L. V., IVANOV, V. A., and KOMRAKOV, G. P.

"Some Statistical Characteristics of Signals Partially Reflected from the D Region of the Ionosphere"

Gor'kiy, Izvestiya VUZ -- Radiofizika, vol 15, No 4, 1972, pp 504-509

Abstract: This paper offers experimentally obtained information regarding the statistical characteristics of partially reflected radio waves and its possible interpretation through a model of "frozen" heterogeneities moving in a horizontal direction. The experimental equipment consisted of a transmitter operating on a frequency of 5.75 MHz, with a pulse power of the order of 750 kW and a pulse width of 50 μs repeated at a 50-Hz rate. A four half-wave dipole, the antenna had a directional diagram of about 56° by 56° at a half-power level and was linearly polarized. The receiver antenna consisted of 36 pairs of crossed dipoles and had a 12° by 12° diagram, and was capable of picking up signals with linear and circular polarization. Auxiliary receiver antennas were also used. Experimental runs were made on separate days in the spring of 1970 and were repeated in March of 1971. Processing

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APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002201020012-1"

USSR UDC: 551.510.535

BENEDIKTOV, Ye. A., et al, Izvestiya VUZ -- Radiofizika, vol 15, No 4, 1972, pp 504-509

of the data consisted in obtaining the amplitude distribution function of the signals for various fixed altitudes, and in determining the autocorrelation amplitude functions. The authors express their gratitude to V. V. Tamoykin for his advice and to T. N. Fedoseyeva for her assistance with the computations. They are associated with the Scientific Research Radio Physics Institute.

2/2

USSR UDC: 621.373.5

GRISHKIN, V. A., POL', L. M., and TELESHEVSKIY, V. I.

"Stable Semiconductor Oscillator With Two Coherent Radio Frequencies"

Moscow, Pribory i tekhnika eksperimenta, No. 2, 1971, pp 122-124

Abstract: The instrument described was designed to help solve problems in experimental optical electronics, particularly in the excitation of ultrasonic light modulators, where there is a need for an oscillator of two harmonic signals whose frequencies differ by an amount several orders less than their nominal values. In this instrument, the difference between the two frequencies is 10^{-4} or 10^{-5} of their nominal value. The oscillator is fully transistorized, and uses a phased automatic frequency control circuit. A block diagram and schematic are given, and the operation of the system is explained. Experiments made on the instrument showed it to have an oscillator instability of $\pm 10^{-5}$. The authors, members of the Moscow Machine-Instrument Institute, express their gratitude to S. F. Korndorf and A. A. Sanin, the latter now deceased, for their comments.

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USSR UDC: 621.793.5

ZIL'BERFARB, M. I. (deceased), ALEKSEYEV, S. N., GRISHKO, A. G., and STRUGOVA, Yu. N., Scientific Research Institute of Concrete and Reinforced Concrete

"Corrosion Resistance of Zinc-Aluminum Coatings Obtained From Melts"

Moscow, Zashchita Metallov, Vol 6, No 5, Sep-Oct 70, pp 621-622

Abstract: The object of this study was the corrosion resistance of zinc-aluminum coatings under atmospheric conditions in alkali media imitating conditions of corrosion in concrete. The base material was 08 kp cold-rolled steel after recrystallization annealing in a bell furnace and temper rolling. The surface preparation technology comprised degreasing with gasoline and a magnesium oxide paste followed by washing with cold water, etching in hydrochloric acid (150-170 g/l), rinsing with cold water, pickling in a mixture of H_2SO_4 (150 g/l) and HCl (50 g/l) for 10 seconds, rinsing with running water, fluxing by dipping in an aqueous solution (g/l) of $ZnCl_2$ 614, NH_4Cl 76, OP-7 1-2; temperature of the solution

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USSR

ZIL'BERFARB, M. I. (deceased), et al, Zashchita Metallov, Vol 6, No 5, Sep-Oct 70, pp 621-622

60-80°C, holding time 10 seconds, drying for 1 minute at 180-250°C; dipping the specimens in a zinc melt containing 0.2-5% aluminum; holding time in the melt 20 seconds, melt temperature 450°C. The coating thickness was measured by the increase in weight. The testing in a sulfur dioxide chamber was conducted at about 100% humidity at 60° C. SO_2 concentration was varied from 0 to 60 mg/m^3. The higher corrosion resistance of coatings with an increased aluminum content in either a sodium chloride solution, tap, or distilled wa ter is explained by the lower solubility of aluminum compounds formed on corrosion as compared to that of zinc compounds.

2/2

GRISHKO, F.I.

Industrial Hygiene

SO: JPRS 55015
25 Jan 72

UDC: 614.1:313.13]:677.463.021.5

MORBIDITY INVOLVING TEMPORARY DISABILITY AMONG YOUNG WOMEN SPINNERS IN THE VISCOSE INDUSTRY

(Industrial Medical)

[Article by I.P. Kramarenko, I.N. Yakovleva, Yu.A. Litvinova, F.I. Grishko; Kiev Scientific Research Institute of Industrial Hygiene and Occupational Disease; Moscow, Sovetskoye Zdravookhraneniye, Russian, No 12, 1971, submitted 14 June 1971, pp 59-62]

The manpower for the chemical industry is annually augmented with qualified workers largely referable to young people ranging in age from 18 to 20 years who have completed a vocational technical school. At this age, as shown by our studies, as well as those of V.A. Deskin, Yu.D. Kalashnikov, and others, there may be increased sensitivity to a number of chemicals encountered in modern industry.

In the spinning mills of the viscose industry, where young men and women, starting at the age of 18 years, learn the trade and work, it is observed that diverse industrial factors exert a combined influence. Among them the predominant role belongs to carbon disulfide, a toxic substance that affects the organism even in relatively low concentrations. One of the early manifestations is a rise in level of nonspecific diseases (B.E. Saf'yan and V.M. Shubik; L.M. Ma[illegible]; N.V. Petrov, and others).

Our objective included investigation of morbidity involving temporary disability among young workers during the first few years of contact with the industrial environment, determination of long term results of such contact, and of the correlation between the indices studied and working conditions. For this purpose a comparative analysis was made of morbidity involving temporary disability among young girls studying to be spinners in the viscose industry, and their peers going through apprenticeship in other than chemical enterprises (of the same age), training period, living conditions, as well as young spinners during their first years on the job in the viscose industry under divers working conditions (some worked in mills where the carbon disulfide concentration in the buildings ranged from 10-30 mg/cubic meter, and [illegible] where the concentration of the same substance did not exceed 10 mg/cubic meter). Finally, a study was made of the morbidity rate among spinners in the viscose industry of different ages, i.e. at the age of 18-20 and 25-30 years, and in each of these groups, tenure constituted 10-15 years at the time

1/2 009 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--ALCOHOLYSIS DURING THE PREPARATION OF UNSYMMETRIC DIESTERS OF PHTHALIC ACID -U-
AUTHOR-(05)-KOMAROVA, R.P., ZVESDKINA, L.I., IGNATOVA, G.N., GRISHKO, N.I., LUKTEV, S.M.
COUNTRY OF INFO--USSR

SOURCE--ZH. PRIKL. KHIM. (LENINGRAD) 1970, 43(5), 1186-8

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PHTHALATE, ALCOHOLYSIS, ESTERIFICATION, GAS CHROMATOGRAPHY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3004/1943 STEP NO--UR/0080/70/043/005/1186/1188

CIRC ACCESSION NO--AP0132204
UNCLASSIFIED

2/2 009 UNCLASSIFIED PROCESSING DATE--20NOV70
CIRC ACCESSION NO--AP0132204
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MONOAMYL PHTHALATE (I) OR MONONONYL PHTHALATE (II) WERE ESTERIFIED WITH NONYL ALC. OR AMYL ALC., RESP., IN THE PRESENCE OF 1.0PERCENT H SUB2 SO SUB4 (ON I OR II). GAS CHROMATOG. OF THE UNSYM. DIESTER SHOWED THAT AT THE OPTIMUM REACTION CONDITIONS BETTER YIELDS WERE OBTAINED WHEN II WAS USED AS A STARTING ESTER. I UNDERGOES ALCOHOLYSIS FASTER THAN II DECREASING THE FINAL YIELDS.

UNCLASSIFIED

Acc. Nr: AP0049776 Abstracting Service: CHEMICAL ABST. 5-70 Ref. Code: UR0191

99958q Use of alcohols from wide fractions for preparing unsymmetrical adipates and maleates. Ignatova, G. N.; Puchkova, V. V.; Moskovkina, E. M.; Grishko, N. I.; Balashova, T. S.; Shlenskaya, T. N. (USSR). *Plast. Massy* 1970, (1), 17-20 (Russ). Unsym. maleates and adipates, e.g., Bu nonyl maleate, Bu undecyl maleate, maleates from C_{5-12} and C_{7-21} alcs., Bu nonyl adipate, and adipates from C_{8-12}, C_{7-9}, C_{12-16} alcs. were prepd. by a 2-stage procedure. Thus, maleic anhydride and the higher alc. were refluxed (in 1:1.02 molar ratio) at 70-90° without a catalyst, then the lower alc. was added (in a 20% excess) and the mixt. was further refluxed with H_2SO_4 at 140-50°. For unsym. adipates the starting material was adipic acid. The content of the monoester in the reaction mixt. was detd. by ir spectroscopy. The unsym. adipates and maleates were used for the modification of poly(vinyl chloride) (I). Modified I exhibited excellent freeze resistance (to −55°) and good physicomech. properties. CKTR

REEL/FRAME 19801694

USSR UDC 512.25/.26+519.5:330.115

GRISHKO, N. V., VAKHUTINSKIY, I. Ya., BUYANOVSKIY, L. A.

"The Kundt-Takker Theorem with Supplementary Limitations and the Decomposition Principle"

Tr. Spets. Konstrukt. Byuro po Avtomatike v Neftepererabotke i Neftekhimii [Works of the Special Design Bureau for Automation in Oil Processing and Petrochemistry], No 3, 1971, pp 138-141, (Translated from Referativnyy Zhurnal, Kibernetika, No 10, 1971, Abstract No 10 V686 by D. Epshteyn).

Translation: The problem of determination of max f(x) is studied under conditions $\phi_i(x) \leq 0$ with the additional limitation $x \in G$, where G is a compact subset of an n-dimensional linear space. Under certain conditions, the problem is reduced to minimization of the nondifferentiable function $F(\lambda) = \max_{x \in G} [f(x) - \sum_i \lambda_i \phi_i(x)]$ under the condition $\lambda_i \geq 0$. The minimum is sought using a method assuming calculation of the pseudogradient of function $F(\lambda)$. In general, the method suggested is a variety of the dual analog of the Danzig-Wulf expansion method.

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USSR UDC 669.112.3

PEREVERSEVA, YE. G., SOKOLOV, K. N., KUDRYAVTSEVA, L. N., and GRISHKO, V. F., Zhdanov Metallurgical Institute

"Effect of Arsenic on the Diffusion of Carbon in Austenite and Ferrite of Low-Carbon Steel"

Moscow, Izvestiya Vysshikh Uchebenykh Zavedeniy -- Chernaya Metallurgiyam No 2, 1970, pp 110-113

Translation: A study was made of the effect of arsenic on the diffusion of carbon in austenite and ferrite. It was established that arsenic increases the rate of carbon diffusion in these structural constituents. With an increase in the content of arsenic from 0 to 1%, the activation energy of St. 3 steel in austenite changes from 35,900 to 31,600, respectively, and in ferrite -- from 18,800 to 16,00 cal/g-atom.

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USSR UDC 669-172:541.12.03

SMIRNOVA, N. S., SMIRNOV, B. G., MIKHAYLOV, S. M., SHUPPE, G. M., and GRISHKOV, G. N.

"Thermoelectronic Emission of Faces of a Single Crystal of Mo-27 Alloy"

Monokristally Tugoplavkikh i Redkikh Metallov [Single Crystals of Refractory and Rare Metals -- Collection of Works], Nauka Press, 1971, pp 78-81

Translation: The thermoelectronic parameters of the (110), (300), and (111) faces of a single crystal of Mo-27 alloy (Mo + 27% Re) are measured at various stages of heat treatment; values are produced for work function φ and Richardson constant A_{eff}. 1 Table; 4 Figures; 5 Bibliographic References.

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USSR UDC 669-172:539.2

KLEYN, G. A., MIKHAYLOV, S. M., KRAKHMALEV, V. A., and GRISHKOV, G. N.

"Substructure of Oriented Single Crystals of Molybdenum of Increased Size Produced by the Zone Growth Method"

Monokristally Tugoplavkikh i Redkikh Metallov [Single Crystals of Refractory and Rare Metals -- Collection of Works], Nauka Press, 1971, pp 63-66

Translation: The substructure of monocrystalline bars of molybdenum 25 mm in diameter produced by the method of zone growth is studied. X-ray analysis using a narrow and broad beam is used to show that in the process of growth decrystallographic orientation of the single crystals is not changed. The substructure of these single crystals is homogeneous and in equilibrium, with the exception of the outer surface layers, in which the mosaic blocks are finer. Disorientation of the blocks of thick single crystals averages 10-40 min. The microhardness in the transverse cross section of the single crystals is constant in value and increases only slightly near the external surface of the single crystals. 4 Figures.

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USSR

UDC 669-172:541.12.036

KLEYN, G. A., OSIPOVA, L. Kh., GRISHKOV, G. N., MIKHAYLOV, S. M., and VOLKOV, O. V.

"Effect of Temperature on the Physical and Mechanical Properties of Oriented Molybdenum Single Crystals"

Monokristally Tugoplavkikh i Redkikh Metallov [Single Crystsls of Refractory and Rare Metals -- Collection of Works], Nauka Press, 1971, pp 153-158

Translation: A study was made of the effect of temperature (1,000°C) on the anisotropy of the physical and mechanical properties of molybdenum single crystals grown in the [001], [110], [111], and [112] directions. 3 Tables; 3 Figures; 8 Bibliographic References.

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USSR

UDC 669.716:621.777.02

DOBATKIN, V. I., GRISHKOVETS, Ya. G., and YAKOVLEV, V. I.

"Technological Properties of Metal in Pressing As a Function of the System of the Homogenization of Ingots"

Metallovedeniye Splavov Legkikh Metallov-Sbornik, Moscow, "Nauka", 1970, pp 137-144, resume

Translation: Results are presented on an investigation of the properties of ingots of alloys D16 and Al+1.1 Mn at a temperature of 400°C and on the technological properties of the metal in pressing as a function of the homogenization system. A conclusion is made on the decreased plasticity characteristics of ingots and the worsening of technological parameters in pressing with increasing quantity of finely dispersed particles in the structure. The homogenization system must be selected with regard to obtaining the required structure of pressed products and, at the same time, the achievement of maximum plasticity of the metal by deformation temperature. The authors consider the most promising variant to be the combination of homogenization with heating with pressure working. Five figures, one table, seven bibliographic references.

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USSR

UDC: 621.375.826

ANAN'YEV, Yu. A., GRISHMANOVA, N. I., KOVAL'CHUK, L. V., SVE-TSITSKAYA, N. A., SHESTOBITOV, V. Ye.

"On the Feasibility of Controlling the Emission From Lasers With Telescopic Cavities"

Moscow, Kvantovaya Elektronika, Sbornik Statey, No 2(8), 1972, pp 85-88

Abstract: An experimental study is made of the possibility of controlling emission from a laser with a telescopic cavity by injecting a signal from an external source into the central zone of the cavity. The necessary average power of the external signal is determined for the case where it is comprised of "spikes" of emission randomly distributed in time. Four illustrations, bibliography of nine titles.

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USSR

UDC 621.375.82

ANAN'YEV, Yu. A., GRISHMANOVA, N. I., KOVAL'CHUK, L. V., SVENTSITSKAYA, N. A., SHERSTOBITOV, V. Ye.

"On the Possibility of Laser Radiation Control With Telescopic Resonators"

V sb. Kvant. elektronika (Quantum Electronics -- Collection of Works), No. 2, Moscow, "Sov. radio", 1972, pp 85-88 (from RZh-Fizika, No 10, Oct 72, Abstract No 10D1019)

Translation: The possibility of controlling laser radiation with a telescopic resonator by introducing a signal from an external source into the central zone of the resonator was investigated experimentally. The necessary average power of the external signal when it consists of randomly distributed subpulses of radiation over time was determined. 9 ref. Authors abstract.

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1/2 033 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--DEFORMATION OF ACTIVE INTERFEROMETER ELEMENTS AND THERMOOPTICAL CONSTANTS OF NEODYMIUM GLASS -U-

AUTHOR-(02)-GRISHMANOVA, N.I., ANANYEV, YU.A.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL PRIKLADNOI SPEKTROSKOPII, VOL. 12, APR. 1970, P. 668-673

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, MATERIALS

TOPIC TAGS--INTERFEROMETER, FLAT PLATE, OPTIC CONSTANT, NEODYMIUM GLASS, RESONATOR, MATHEMATIC EXPRESSION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1310 STEP NO--UR/0368/70/012/000/0668/0673

CIRC ACCESSION NO--AP0124961

UNCLASSIFIED

2/2 033 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0124961

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SURVEY OF INFORMATION CONCERNING THE RESONATOR DEFORMATIONS OCCURRING DURING THE PUMPING OF LARGE DIAMETER INTERFEROMETER RODS IN ILLUMINATORS OF VARIOUS CONFIGURATIONS. FORMULAS FOR DETERMINING THE RESONATOR DISTORTIONS DURING PUMPING ARE GIVEN FOR CIRCULAR CYLINDRICAL RODS AND ACTIVE ELEMENTS IN THE FORM OF FLAT PLATES. IT IS SHOWN THAT THERMAL DEFORMATIONS OF THE RESONATOR DEPEND ON TWO THERMOOPTICAL CONSTANTS OF THE ACTIVE MEDIUM. THE RESULTS OF MEASUREMENTS OF THE THERMOOPTICAL CONSTANTS OF THE MOST WIDELY USED BRANDS OF NEODYMIUM GLASS ARE CITED AND ARE SHOWN TO BE IN GOOD AGREEMENT WITH THE RESULTS OF CALCULATIONS.

UNCLASSIFIED

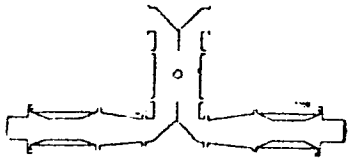
USSR UDC: 621.372.852.27

GRISHMANOVSKIY, V. A., TUCHIN, B. M.

"A Waveguide Phase Shifter"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 10, Apr 71, Author's Certificate No 298017, Division H, filed 15 Sep 69, published 11 Mar 71, p 178

Translation: This Author's Certificate introduces a waveguide phase shifter with continuous phase variation containing a slot bridge, a conical adapter and a 90-degree differential phase section based on a circular waveguide. As a distinguishing feature of the patent, the dimensions and weight of the movable parts are reduced by butting a short-circuited rectangular waveguide section which is free to rotate up against the above-mentioned section of circular waveguide. This rectangular waveguide section is critical for one of the linear components of the circularly polarized wave.



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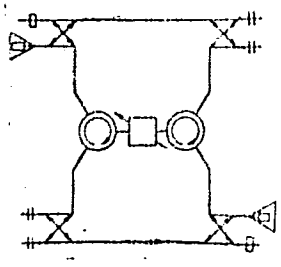
UDC 621.372.837.3

VINOGRADOV, YU. V., GRISHMANOVSKIY, V. A.

"Electrically Controlled Superhigh-Frequency Commutator"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 16, 8 May 70, p 41, Patent No 270019, Filed 17 Feb 67

Translation: This Author's Certificate introduces a two-position, two-direction electrically controlled superhigh-frequency commutator containing slot bridges, circulators and a mutual phase converter. It is distinguished by the fact that in order to improve reliability, decrease the magnitude of the consumed current and simplify the control circuit, the phase converter (0-180°) is connected to four slot bridges via circulators.



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USSR UDC 669.285'295'296;784.018.44:620.186

GRISHOV, V. I., DRACHINSKIY, A. S., KAVERINA, S. N., PISARENSKO, V. A., and TREFILOV, V. I., Institute of the Physics of Metals, Academy of Sciences Ukrainian SSR

"Change in the Structure and Properties of Molybdenum After Heating in the High-Temperature Range"

Metallofizika. Resp. mezhved. sb. (The Physics of Metals. Republic Interdepartmental Collection of Works), 1970, vyp. 30, pp 42-49 (from RZh-Metallurgiya, No 3, Mar 71, Abstract No 3I732 by Authors)

Translation: The following two types of heat treatment were used to obtain different structural states of Mo alloy with 0.39% Ti, 0.19% Zr, and 0.007% C: annealing in a TVV-4 furnace in a vacuum of $5 \cdot 10^{-4}$ mm Hg with four-hour holding and a cooling rate of ~ 1 deg/sec; heating by passing alternating current through a specimen at a heating rate of ~ 150 deg/sec and a cooling rate of 200 deg/sec. Specimens annealed at different temperatures under these conditions underwent mechanical tensile tests and microhardness measurements. The influence of structure on the strength characteristics of the alloy was studied. A significant increase was found in the strength and ductility values of specimens electric-heat-treated to 2000° as compared with annealing heat-

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GRISHOV, V. L., et al., Metallofizika. Resp. mezhved. sb., 1970, vyp. 30, pp 42-49

treated specimens. Aging processes were observed in the Mo alloy in some cases after heat treatment. Eleven illustrations. Bibliography with four titles.

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GRISHUKHIN, V. P.

"One Class of Comparison Algorithms"

Issled. po Diskretnoy Mat. [Studies in Discrete Mathematics -- Collection of Works], Moscow, Nauka Press, 1973, pp 189-199 (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V411)

Translation: Suppose there are n elements $a_1, a_2, \ldots, a_n$, any two of which can be compared, indicating which is stronger than the other. An element is the ℓ-strongest element if it is stronger than a certain $n - \ell$ elements and weaker than the remaining $\ell - 1$ elements. Suppose several of the strongest elements are known. Then element a_i, which is not one of these elements, is called a candidate if it has not lost any comparison except, perhaps, comparisons with the strongest elements. This work studies a class $\mathfrak{A}$ of algorithms which compare at each step the candidates in order to determine the k strongest elements. It is shown that the minimum number S(n,k) of comparisons of two necessary to complete the operation of an algorithm from class $\mathfrak{A}$ satisfies the inequality

$$S(n, k) \geq n-k+\sum_{i=1}^{k-1} \lfloor \log_2 (n-i+1) \rfloor.$$

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GRISHUKHIN, V. P., Issled. po Diskretnoy Mat, Moscow, Nauka Press, 1973, pp 189-199

The existence of an algorithm $A \in \mathfrak{A}$ is proven, for which

$$S(n, k) = n - k + \sum_{i=1}^{k} \lfloor \log_2 (n - i + 1) \rfloor.$$

A. Sapozhenko

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GRISHUKHIN, V. P.

"On the Average Number of Iterations of the Balash Algorithm"

Moscow, Issled. po diskretnoy mat.--sbornik (Studies in Discrete Mathematics--collection of works), "Nauka", 1973, pp 58-68 (from RZh-Matematika, No 8, Aug 73, abstract No 8V512 by Yu. Finkel'shteyn)

Translation: The author considers a problem of whole-number integral programming (problem p)

$$\sum_{j=1}^{n} c_j x_j \to \min,$$

$$\sum_{j=1}^{n} A_j x_j \geq B, \quad (A_j, B \in R^m),$$

$$x_j = 0 \text{ or } 1, \quad j = 1, \ldots, n.$$

Here A_j, B are m-dimensional vectors with components a_{ij}, b_i; the numbers c_j and the vectors A_j, B correspond to some point in space $R^1 \times R^{mn} \times R^m = R^{(n+1)(m+1)-1}$, and vice versa: any vector $z \in R^{nm+n+m}$ will correspond to the

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GRISHUKHIN, V. P., Issled. po diskretnoy mat., "Nauka", 1973, pp 58-68

coefficients of some problem p if z is written in the form z = (C, A, B), where $C=(c_1, \ldots, c_n)\in R^n$, $A=(A_1, \ldots, A_n)\in R^{nm}$, $B\in R^m$.

In this way a one-to-one correspondence is established between problems p and points R^{n+mn+m}. Then R^{n+nm+m} is considered with the ordinary Euclidean metric, and the measure

$$\mu(dp)=\prod_{i\in N}\sum_{l\in M} dc_i da_{il} db_l,$$

is assigned to the set of problems dp; where N = {1, 2,..., n}, M = {1, 2,... ..., n}. Certain regions in space R^{n+nm+m} are then considered whose measure is their volume. The set of problems corresponding to some region G the author calls class of problems p_G. For some function f(p) on problems from class p_G the author defines its average on the class

$$I_G=\frac{1}{|G|}\int_G I(p)\,\mu(dp),$$

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where $|G|$ is the volume of region G. Then only one function $\phi(p)$ is considered -- the number of steps of the Balash algorithm. This function was introduced in a paper by the author (RZhMat, 1973, 5V652); in this same paper the author examined the region G given by the inequalities

$$c_j > \sum_{j=j+1}^{n} c_j \geq 0 \text{ for all } j \in N,$$

$$A_1 > A_2 > \ldots > A_n;$$

it is shown that $\phi(p)$ on the class of problems which corresponds to the region (and is called there $P_C(n)$) does not depend on the vector $C=(c_1,\ldots,c_n)$ and satisfies certain conditions. The author then studies the average $\overline{\phi}_G(A,c)$, where G(A,c) is the region G bounded by conditions $c_1 \leq c$, $A_1 < A$, $A_n > 0$, $0 < B < \sum_{1}^{n} A_j$. Here c is a number and $A=(a_1,\ldots,a_m)$ is a vector.

We note that $G(A,c) = G(A) \times G(c)$, and since $\phi(p)$ is not dependent on c, $\overline{\phi}_G(A,c) = \overline{\phi}_G(A)$. It is shown that $\overline{\phi}_G(A)$ does not depend on A, so that we can write $\overline{\phi}_G(A) = \overline{\phi}_m^n$. After fairly cumbersome operations it is shown that

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$$\bar{\varphi}_m^n = \frac{3\pi}{n^2} 2^{n-m+2}\left(1 + O\left(\frac{1}{n}\right)\right).$$

This formula gives the behavior of $\bar{\phi}_m^n$ as $n \to \infty$ when m is fixed. It is further shown that

$$\bar{\varphi}(n) = \lim_{m\to\infty} \bar{\varphi}_m^n = n + 1.$$

In RZhMat, 1973, 5V652 it was found that

$$\varphi(n) = \sup_{p \in P_C(n)} \varphi(p) = C_n^{\left[\frac{n}{2}\right]} + C_{n-1}^{\left[\frac{n}{2}\right]} = \frac{3}{\sqrt{2\pi n}} 2^n\left(1 + O\left(\frac{1}{n}\right)\right).$$

Thus the average number of iterations of the Balash algorithm on region $P_C(n)$ (just as the maximum number) increases exponentially with an increase in the number of variables n (for fixed m). On the other hand, if n is fixed, then this average approaches the limit (n + 1) exponentially with

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GRISHUKHIN, V. P., Issled. po diskretnoy mat., "Nauka", 1973, pp 58-68

increasing m. The author states that "the exponential dependence of the average number of iterations of the Balash algorithm on n in region $P_C(n)$ is completely due to not accounting for the goal function." To substantiate this statement, he considers the algorithm $Б_1$ from RZhMat, 1973, 5V652, which involves a very simple rule for selecting j; namely, $j_s = \min_{j \in N_k^{s-1}} j$ (and the goal function is disregarded). Then calculating the average $\overline{\varphi}_m^n(Б_1)$ from the region

$$G = \left\{0 < A_j < A, \quad j \in N, \quad 0 < B < \sum_{j=1}^{n} A_j\right\}$$

as was done above, we find that

$$\overline{\varphi}_m^n(Б_1) \to \frac{m}{n} 2^{n-m+1} \quad \text{when} \quad n \to \infty,$$

$$\overline{\varphi}_m^n(Б_1) \to n+1 \quad \text{when} \quad m \to \infty.$$

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GRISHUKHIN, V. P., Issled. po diskretnoy mat., "Nauka", 1973, pp 58-68

The author's final conclusion: in order to appreciably reduce the number of iterations for problems with a large number of variables, estimates on the goal function should be used.

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GRISHUKHIN, V. P.

"Estimate of the Complexity of the Balesh Algorithm"

Moscow, Mat. metody resheniya ekon. zadach--sbornik (Mathematical Methods of Solving Economics Problems--collection of works), No 3, "Nauka", 1972, pp 93-105 (from RZh-Kibernetika, No 5, May 73, abstract No 5V652 by Yu. Finkel'shteyn)

Translation: The author considers the problem of integral linear programming with Boolean variables (problem p_0)

$$z = \sum_{j \in N} c_j x_j \to \min, \quad Y = \sum_{j \in N} A_j x_j > B, \quad x_j = 0 \text{ or } 1, \ j \in N.$$

Here A_j and B are vectors with components $a_{ij}, b_i, i \in M = (1, 2, \ldots, m)$, $N = (1, 2, \ldots, n)$. Without violating generality it may be assumed that all $c_j \geq 0$. An investigation is made of one of the algorithms proposed for solving problem p_0 -- the additive algorithm of Balash (RZhMat, 1966, 4V140). A series of machine experiments has shown that computational difficulties in using the Balash algorithm increase sharply with an increase in the complexity

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GRISHUKHIN, V. P., Mat. metody resheniya ekon. zadach, No 3, "Nauka", 1972, pp 93-105

of the problem. In particular in some experiments considerable computational difficulties arose in solution of problems with as few as 30-33 variables. The first theoretical investigation of the effectiveness of the Balash algorithm was done by V. K. Korobkov (appendix to translation of the paper by E. Balash, "Kibern. sbornik (novaya seriya)", vyp. 6, Moscow, "Mir", 1969, pp 253-258). In this paper a detailed theoretical study is made of the effectiveness of the Balash algorithm.

Let $\phi_A(p)$ be the number of steps necessary for solving the problem p by algorithm A. As a measure of the effectiveness of algorithm A on class of problems P the number

$$\varphi_A(P) = \sup_{p \in P} \varphi_A(p).$$

is used. In our following discussion we take the Balash algorithm (algorithm Б) as algorithm A. The principal part of the study deals with the class $P = P(n)$ of problems such that the vectors of conditions A_j can be ordered. It is assumed that they are renumbered so that $A_1 \geq A_2 \geq \ldots \geq A_n$.

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Obviously problems with a single restriction (the knapsack problems) go completely into class $P(n)$. It is shown that

$$\varphi_{\text{Б}}(P(n)) = C_n^{\left[\frac{n}{2}\right]} + C_{n-1}^{\left[\frac{n}{2}\right]}.$$

Let algorithm B differ from algorithm Б in that the rule of selection j takes no account of the target function. The author states that by a slight modification of these considerations it can be shown that

$$\varphi_{\text{B}}(n) = C_n^{\left[\frac{n}{2}\right]} + C_n^{\left[\frac{n}{2}\right]-1} = C_{n+1}^{\left[\frac{n+2}{2}\right]}.$$

Let $P^+(n)$ be a class of problems for which $A_j \geqslant 0$ for all $j \in N$. V. K. Korobkov (RZhMat, 1965, 11V205) noted that each problem $p \in P^+(n)$ can be put into correspondence with a monotonic Boolean function. Computation of this function at a single point corresponds to checking for admissability of the plan of problem p; Korobkov gave the following estimate for the number of such check computations

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